

# Preface

The vibration of simple structures like beams and plates was discussed in Volume I of Vibro-Acoustics. Various wave types and their propagation in simple structures were investigated. The coupling effects between the basic wave types propagating in real constructions were demonstrated in the first volume.

In Volume II the response and dynamic characteristics of more complicated structures like shells, composite panels and frame reinforced plates typical of many types of vehicles are derived. The acoustic coupling between these structures and the energy flow between them are important parts of Volume II. The interaction between structures and fluids is also highlighted.

Volume II of the text includes a chapter on variational methods. The technique is used for the derivation of equations governing the vibration of sandwich and other composite elements and some simple shell elements. In the following chapter the coupling between mechanical systems is explored. This includes an introduction to the vibration of rubber mounts, resilient mountings and the design of engine foundations. Then follow chapters on waves in fluids including outdoor sound propagation and room acoustics. Coupling effects between vibrating structures and a surrounding fluid or quite simply sound radiation and sound transmission loss and fluid loading of structures are the subjects of the next chapter. Discussions on random excitation of structures follow. Finally, some methods, including Statistical Energy Analysis, for the prediction of excitation and propagation of structure-borne sound in large built-up structures are investigated.

A number of problems are formulated at the end of each chapter. Solutions to the problems are given in Volume III. A summary of some basic equations presented in the first two volumes are summarized in Volume III. Many results discussed in Volume II are verified by model and full-scale measurements.

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